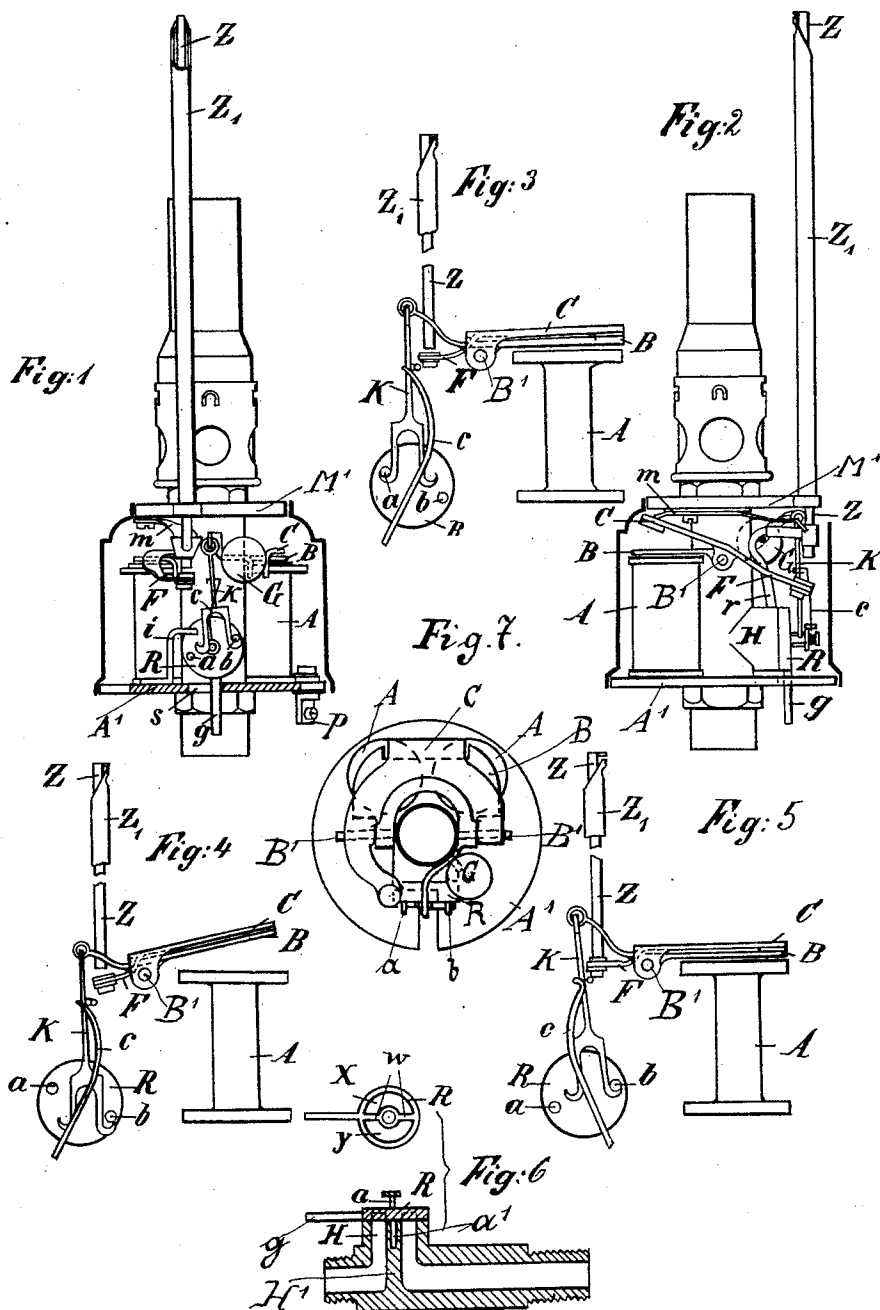


(No Model.)

E. SCHMIDT.
ELECTRIC GAS LIGHTING DEVICE.

No. 571,288.

Patented Nov. 10, 1896.



Witnesses:

Karl Bins.

Richard Lang.

Inventor:

Ernest Schmidt

by:

Ernest W. Hopewell
Attorney.

UNITED STATES PATENT OFFICE.

ERNEST SCHMIDT, OF BERLIN, GERMANY.

ELECTRIC GAS-LIGHTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 571,288, dated November 10, 1896.

Application filed August 1, 1896. Serial No. 601,351. (No model.)

To all whom it may concern:

Be it known that I, ERNEST SCHMIDT, a subject of the King of Prussia, German Emperor, and a resident of Berlin, in the Kingdom of Prussia, German Empire, have invented a certain new and useful Improved Device for Lighting Gas and other Lamps, of which the following is a full, clear, and exact description.

The present invention relates to devices for lighting gas and other lamps automatically by means of electricity; and it consists of the details of construction hereinafter set forth, and particularly pointed out in the claims; and in order to render the present specification more easily intelligible reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figure 1 is a front elevation of the lower part of an incandescent gas-burner, showing the igniting device with the cap or casing of the same in section. Fig. 2 is a side elevation of Fig. 1, the cap being in section. Fig. 3 is a detail side elevation showing the operation of the mechanism for turning the gas-cock on and off, the mechanism being in the position it occupies when the cock has just been turned on. Fig. 4 is a similar detail elevation showing the double pawl in the act of engaging the opposite pin of the gas-cock to turn the gas off on the next movement of the armature controlling the said pawl. Fig. 5 is a similar elevation showing the armature attracted by the electromagnet and the cock turned off. Fig. 6 is a detail sectional elevation of the cock employed in connection with the present device; and Fig. 7, a horizontal section through the burner-tube, taken just above the armature-pivot and showing the double armature in plan view.

According to the present invention the whole igniting mechanism, with the exception of the battery, is mounted on a base-plate A', arranged at the lower part of the burner-tube, and a partially-rotating disk R is employed to turn the gas on and off, although any other suitable cock might be used without departing from the nature of the present invention. This disk may be seen in section at Fig. 6 and is provided with depressions x and y on its facing and with a central bridge-

piece w , dividing the said depressions, while the gas-tube is provided with a lateral facing, on which the disk turns on a pivot, said tube having a partition II', so that the gas can only pass to the burner along the channel II through the depressions x and y , and when the disk is turned so that the bridge w corresponds with the partition and the gas supply will be cut off. The disk R is pivoted at a' to the partition and provided with two substantially diametrically oppositely arranged pins a and b , over which the double pawl K, which is actuated by the electromagnet A, can engage alternately, and exercising a pull on same opens or closes the cock. The cock is provided with a downwardly-extending tail g , which passes through a slot in the base-plate A', the ends of said slot forming stops for the movement of the disk R, as will be seen from Fig. 1.

Attached to the center of the disk R is a spring c , which engages the arm of the double pawl K in the following manner: The double pawl K is loosely suspended from the projecting arm of a double armature, hereinafter to be described. When the armature is attracted, the pawl is raised, and when the same is released the pawl sinks to its lowest position. The object of the spring c is to throw the pawl K or its corresponding hook under the hooks or pins a and b of the disk R alternately. Thus, for instance, supposing the two pins a and b to be in the horizontal plane opposite each other and the cock neither closed nor fully open, then the spring c will exercise no pressure on the rod of the pawl. If now the cock is fully opened by the action of the armature, as shown at Fig. 3, then the spring will have been turned by the movement of the disk R, to which it is attached, and will exercise pressure on the pawl-rod, tending to push it to the right of Fig. 3. As soon now as the armature has been released the pawl will fall and the action of the spring c will throw it under the pin b , as shown at Fig. 4. On the next movement of the armature the pawl will pull the disk round in the opposite direction by means of the pin b and close the cock, simultaneously turning the spring in the opposite direction, so that on the next release of the armature the pawl on falling will be thrown under the pin a ready

to turn the cock in the opposite direction at the next movement of the armature.

The electromagnet A is mounted on the base-plate A', and a double armature B C is pivotally supported on pivots B' B', fixed in the sides of the burner-tube. The arrangement of the armatures B C will be best seen from Figs. 1, 2, and 7. Both armatures are arranged to turn on the same pivots, as clearly shown at Fig. 7, and the lower armature B is provided with a counterpoise G, which pulls it away from the magnet when the latter is not excited. The upper armature C passes through a recess in the lower one B at a point above the electromagnet and is capable of vibration on its pivots without influencing the armature B, for a reason hereinafter stated. The lower armature B is extended round behind the burner-tube, looking from the magnet side of the same, and carries at this side the double pawl K, which is loosely suspended therefrom, so that a movement of the lower armature B will operate the pawl K. The upper part C of the armature when attracted will close a spark-generating electric circuit by means of tubular rods Z and Z'. The outer rod Z' is fast on a plate M' on the burner-tube, and the inner tube Z is insulated and vertically guided to slide within the tube Z', the upper ends of the said tubes being formed to produce electric sparks when the armature is attracted. The inner tube Z is normally held down, with its upper bent round end, Fig. 2, resting on the upper end of the tube Z', by means of an insulated spring m, mounted on the under side of the plate M' and acting on the lower end of the tube Z to keep the same down on the tube Z'. The lower end of the inner tube Z is connected by a small tube r to the gas-cock, and its upper end is formed to produce a jet-flame, when the cock is opened, which will be ignited by the electric sparks generated at this point.

One pole of the battery is connected to the contact-screw P on the plate A', which is insulated from the gas-tube of the burner, and the other pole is connected to the burner-tube.

The end F of the upper armature C is formed to engage under the end of the rod Z when this armature is attracted and push the same slightly upward, so that electric sparks will be formed at the upper end of the tubes Z Z'.

When the current is sent through the apparatus, both the armatures will be attracted, one, B, opening the gas-cock in the manner already described, and the other, C, slightly raising the jet-flame tube Z against the pressure of its spring m, so that gas will be fed to this tube through r, and at the same time sparks will be generated at the upper ends of Z and Z' and the jet-flame lighted. On turning off the current the armature will be released and the pawl will fall down ready to engage the opposite pin of the disk R at the

next attraction of the armature and operate the cock in the opposite direction. The object of making the armature in two parts B and C is that when sparks are produced at the upper ends of Z Z' by the contact of the end F of the lever C with the lower end of Z the latter is liable to vibrate, and were the armature in one piece this vibration would be liable to be communicated to the cock and cause the same to be turned partially back, possibly before the gas may have been lighted. In the present case the part C of the armature is free to vibrate and cannot communicate its vibration to the part B, which remains in position on the electromagnet as long as the same is excited.

Instead of arranging a jet-flame it is obvious that the electric sparks may be employed to ignite the gas direct without first igniting the jet, but the latter is preferable in connection with incandescent gas-lamps.

I claim as my invention—

1. An apparatus for automatically igniting gas and other lamps by means of electric current which consists of an electromagnet having an armature consisting of two independently-movable members, a gas-cock operatively connected to one member and an igniting device operatively connected to the other member, and means for sending one and the same current through the electromagnet-coils and to the spark-producing device substantially as described.

2. The combination of an electromagnet having an armature consisting of two members, said two members being capable of reciprocatory movement on and round the same pivots, a gas-cock operatively connected with one member and an igniting device operatively connected to the other member, and means for operating the armature and the igniting device by one and the same current substantially as described.

3. The combination of an electromagnet having a double armature as specified and means for connecting one member of said armature to the igniting device, a gas-cock and means for operatively connecting the other armature member thereto consisting of a double pawl, suspended from said armature member and adapted to engage alternately pins on the revoluble gas-cock, and a spring attached to the gas-cock and rotated therewith said spring connected to the double pawl and operating the same substantially as described.

4. The combination of an electromagnet having an armature consisting of two members, pivotally supported as specified, one of said members being operatively connected to the gas-cock, and the other to an igniting device consisting of a hollow rod extending in proximity to the burner, and a tube insulated therein and capable of substantially vertical movement therein, an insulated spring m to press said tube downward and an extension

to said second member to engage the lower end of said inner tube when the magnet is excited and electric connections to the magnet and to the igniting device for the purpose substantially as described.

5 5. The combination of an electromagnet A having a double armature B C pivotal connections for said armature to the burner-tube at B', a cock R in the burner-tube consisting
10 of a revoluble disk having pins *a* and *b* and recesses *x y* said disk being pivotally connected to a partition dividing said burner-tube, a double pawl K suspended from the member B of the armature, and a spring actuated by the rotation of the cock-plug to
15 throw the said double pawl in opposite directions alternately and corresponding to the position of the cock, a conductor Z' fast on a plate of the burner and extending in proximity to the burner-head, a spring-actuated
20 conductor Z insulated as regards the conductor Z' and adapted to form therewith a spark-producing head and means for transmitting

the motion of the armature member C to said conductor substantially as described.

25 6. The combination of an electromagnet having an armature consisting of two members substantially as described, means for operatively connecting one member to the gas-cock, and means for operatively connecting the other member to a spark-producing
30 device, and a spark-producing device consisting of a fixed hollow conductor Z' in connection with one pole of a battery, and a spring-actuated conductor Z connected to the other pole of the battery a jet-flame orifice at
35 the top of the latter conductor and means for connecting the lower end of same to the burner-tube above the gas-cock.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ERNEST SCHMIDT.

Witnesses:

W. HAUPT,
HENRY HARPER.